San Francisco Bay Streams

The Setting

There are 57 major rivers and creeks that enter San Francisco Bay, not counting the Sacramento and San Joaquin rivers. Those 57 are fed, in turn, by 106 smaller streams. Virtually all of these streams historically supported spawning runs of salmon and steelhead trout. Today, only a few of them are capable of providing the needed spawning or rearing habitat.

Salmon and steelhead still enter and spawn in the Napa and Petaluma rivers, Sonoma Creek, Corte Madera Creek, Walnut and Wildcat creeks, Alameda Creek, the Guadalupe River and San Francisquito Creek.

The Problems

Bay area rivers and creeks have benefitted from several citizen restoration projects. These projects deserve continued support and encouragement from the Department of Fish and Game. It is not likely that the remaining salmon or steelhead streams in the area could be restored to support traditional fishing pressure. These streams can, however, act as preserves or outdoor classrooms – special places where the effects of development have been reversed enough to provide a glimpse of unspoiled nature.

Each stream has its own problems and opportunities. Wildcat Creek in Richmond, for example, exists only because its neighbors refused to accept a conventional flood control channelization project. Controversy over the Wildcat Creek project helped educate engineers and laypersons alike, to the physical, fiscal and social advantages of non-structural solutions to flood problems. Had the Wildcat Creek lesson come earlier, there would undoubtedly be many more productive salmon and steelhead streams in urban California.

Alameda Creek has strong restoration potential because its stream flow, which has been exploited, can be augmented with State Water Project supplies en route from the Delta to urban Project customers. Such "conjunctive" water use opportunities abound in California; they can contribute substantially to the statewide salmon and steelhead restoration program.

The California Department of Water Resources conducts a very popular, albeit modest, program of financial assistance to community groups engaged in the restoration of urban streams. There is enormous potential here; there is also much value in teaching the public about the advantages of low-cost, socially beneficial, non-structural solutions to community flooding problems. The Department's program can provide major benefits to the state over time and should surely be expanded.

The Solutions

ACTION: The Legislature should expand the Department of Water Resources' urban creeks restoration program. The program is complimentary to the restoration program outlined in SB 2261.

San Joaquin River Basin

The Setting

The San Joaquin River system flows from south to north, ending at the Delta where it joins the Sacramento River. This basin includes the watersheds of the Kern, Tule, Kaweah, Kings, Merced, Tuolumne, Stanislaus, Mokelumne and Cosumnes rivers.

Located at the southern end of the drainage, the Kern, Tule, Kaweah and Kings rivers only connect with the San Joaquin during extremely wet years. The federal dam built at Friant during the 1940's stopped spawning migrations and dewatered the San Joaquin River for a downstream distance of 50 miles —thus eliminating salmon and steelhead

PHOTO: BUREAU OF RECLAMATION

With proper stream flow. the three main San Joaquin tributaries could accommodate 85,000 natural

production there. Much further to the north, the Cosumnes and Mokelumne rivers join the San Joaquin downstream of Stockton, but only after the river has entered the Sacramento-San Joaquin rivers Delta.

Salmon and steelhead production on the San Joaquin River system is focused on 1) the Merced, Tuolumne and Stanislaus rivers and 2) the San Joaquin's main stem, from the junction of the Merced River downstream to Stockton.

The Problems

At one time, king salmon spawning runs in the San Joaquin drainage approached 300,000; this was comprised, in large part, of spring-run fish that migrated to the cool, upper elevation reaches of the drainage. The development of high-elevation dams on the Merced, Tuolumne and Stanislaus rivers, prior to 1940, blocked these annual upstream migrations and reduced the estimated average basin-wide spawning run to 150000 fish.

The construction of storage reservoirs al the lower elevations has blocked spawning migrations further; the few salmon that remain are fall-run fish. There are a few steelhead remaining in the Stanislaus River, as well.

The federal Friant Dam has severely reduced stream flow to the main San Joaquin River at a point 20 miles northeast of Fresno since 1946. A significant spawning population was lost. To date, no stream flow provisions have been made for any fish life below Friant Dam. The only time there is adequate stream flow is during very wet winters.

Despite these serious alterations in stream f low, there is usually adequate late-fall flows to lead spawners to their Merced, Tuolumne and Stanislaus home streams. Unfortunately, the water conditions for the rearing

"King salmon runs on the San Joaquin River have dropped by 90% and a similar decrease has occurred on the Trinity River in the last 20 years..."

and downstream migration of young fish are poor in these home stream areas. As a result, fish survival is poor.

Good gravels but inadequate flows on the Merced, Tuolumne and Stanislaus

Historically, these three rivers enjoyed abundant salmon spawning activity. The dewatering of the rivers in the San Joaquin system has led to an ongoing decline in spawning activity. For instance, spawning runs on the Tuolumne averaged just 5,400 fish during the 1970's. Spawning on the Stanislaus averaged just 3,100 fish for the same period. The Merced's *average* during the 1 960's was truly dismal, a mere 240 fish.

Each of these rivers, however, *could* support strong spawning runs. The Tuolumne has adequate spawning gravels to support 40,000 adults, the Stanislaus, 20,000 and the Merced, 25,000. What accounts for the difference between capacity and the disappointing annual averages? Simply, the availability of adequate stream flow at critical times for spawning, hatching, rearing and outmigration.

In 1984, 12,000 spawners were counted on the Stanislaus. In 1985, the Merced's fall run totaled 25,500 fish. The same year, a run of 39,000 fish was observed on the Tuolumne. In all three cases, heavy spring rains or snowmelt during 1982 and 1983 made for high juvenile survival on the downstream migration — such high survival rates that record numbers returned to spawn in 1984 and 1985. The Merced River's increase was likely boosted by the production from the Department of Fish and Game's Merced Fish Facility, as well,

When combined, the natural salmon spawning potential of these three important rivers is 85,000 fish a year. If adequate rearing and outmigration flows are provided, 85,000 spawners could contribute 1 70,000 fish to the sport and commercial salmon harvests. *This would represent an 850% increase over the 1970's production levels.*

Maintaining adequate stream flow for fish

These figures do nothing more than demonstrate what is possible given adequate flows. Salmon and steelhead cannot depend on a few extremely wet years. Changes must be made in both state and federal water project programs to provide adequate and predictable flows for fish.

Changes must occur at the New Don Pedro reservoir on the Tuolumne River, for example. The existing federal power license there requires that from 64,000 to 123,000 acre-feet of water should be provided for fish conservation. The exact amount depends on the dryness of the years. The irrigation district has recently applied for a license amendment. This triggered a request from the Department of Fish and Game for improvements in the fishery stream flow delivery schedule. Here, as elsewhere in the San Joaquin basin, there is too little stream flow for late-winter rearing and for springtime downstream migrations. This type of intervention by the Department of Fish and Game is crucial if fish survival is to be increased in this area.

Similar requests for stream flow are being made on the Stanislaus River. When it reauthorized construction of the New Melones Dam, Congress reserved 69,000 to 98,000 acre-feet of water each year for conservation of downstream fish life. In 1972, the Department of Fish and Game reported to the State Water Resources Control Board a need for approximately 300000 acre-feet for salmon production on the Stanislaus River. The Board ruled, at that time, that more research was needed to verify this claim.

In 1987, the DFG and the U.S. Bureau of Reclamation, which sells the water from New Melones reservoir, agreed to conduct a seven-year study to determine precisely how much water is needed to optimize salmon production on the Stanislaus. Fish conservationists have noted that the initial state-federal agreement did not consider the needs of the river's steelhead trout; consequently. they have petitioned the State Water Re-

sources Control Board to reconsider relying on this agreement as a basis for water rights decision-making on the river.

Inadequate flows and pumps trouble the Lower San Joaquin River

Most of the stream flow that escapes the numerous diversions upstream is drawn from the lower San Joaquin River. It moves, via Old River. to the federal Central Valley Project pumps near Tracy. Old River is, literally, an historic channel of the San Joaquin. Ocean-bound salmon and steelhead juveniles are sucked along with the water to the pumps. where they die. As the amount of water drawn to the pumps increases, so does the mortality rate of young salmon and steelhead.

The Department of Fish and Game estimates that *up to* 96% of the fall-run king salmon juveniles born in the San Joaquin River watershed are lost to federal and State Water Project pumping in the Delta, It is imperative that efforts to conserve salmon and steelhead in the San Joaquin River basin include the restoration of stream flow in the lower river to allow safe downstream passage of young fish.

The Department of Fish and Game made vigorous recommendations at the 1987 Bay-Delta water hearings for enough stream flow to allow juveniles to pass the pumps. It also advised that a gate or some other device be constructed and operated at the Old River diversion during peak migration periods. If recovery of salmon and steelhead trout resources is to become a reality in this watershed, the state must adopt these recommendations.

The Solutions

ACTION: The State Water Resources Control Board has the power to restore the salmon and steelhead resources of the San Joaquin River basin. It should do all of the following:

- Adopt an interim moratorium on further allocation of stream flow in the basin;
- Complete its inventory of the unappropriated water resources in the basin;
- With assistance from the Department of Fish and Game, determine the stream flow and water quality conditions necessary for young salmonids to move safely from their home streams to the western Delta;
- Direct the major water rights holders to cooperate in determining how to reorganize water use through exchanges, conjunctive use opportunities and modification of state and federal projects; and
- Place enforceable fish conservation conditions on those water permits and licenses which now lack them, including the operations of the federal Friant Dam. (Many of the original water sales contracts for Friant water will terminate in 1990. It is appropriate, now, to include Friant operations in the search for water needed to assure juvenile salmon safe passage to the Delta.)

NOTE: Many recommendations affecting the San Joaquin River Basin are presented in Section One.

Central and South Coast Streams

The Setting

This region encompasses California's coast south of San Francisco Bay. Silver salmon historically spawned in California's coastal streams as far south as Monterey Bay. *Steelhead trout once ranged as far south as Mexico.* The exploitation of these coastal streams for irrigation and domestic water supplies has severely reduced the number that still support annual salmon and steelhead spawning runs. One of the largest annual steelhead runs in the area is found on the Carmel River – a run of nearly 2,000 spawners. This spawning population survives from a run of **20,000 fish some** sixty years ago.

The Problems

Urbanization of this coastal area and the